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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,678	07/30/2001	Gregg Niven	P02877	2176

7590

03/12/2003

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EXAMINER

SANDERS JR, JOHN R

ART UNIT

PAPER NUMBER

3737

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

N.K

Office Action Summary

Application No.

09/918,678

Applicant(s)

NIVEN ET AL.

Examiner

John R. Sanders

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☒ Claim(s) 11, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Inventorship

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Specification

2. The disclosure is objected to because of the following informalities:

Page 7, par. 20: "flow chart 44" should be --flow chart 46-- for consistency with the drawings.

Page 8, line 7: Examiner has taken "Step 42" as actually referring to --Step 50--.

Appropriate correction is required.

Drawings

3. This application has been filed with informal drawings that are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Claim Objections

4. Claims 11, 17, and 18 are objected to because of the following informalities: The use of parentheses in a claim is considered improper. In claim 11, line 2, consider deleting "(ICL)" and replacing "ICL" with --intra-corneal lens--. In claims 17 and 18, consider changing "inter-corneal" to --intra-corneal-- for consistency. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14, 16-22 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,299,307 to *Oltean et al.*

Oltean et al. discloses an eye-tracking device that uses corneal margin detection. *Oltean et al.* discloses several different embodiments that illuminate the limbus, receive scattered light from the limbus, and then determine the limbus edge (col. 3: 1-11). One embodiment involves multiple light sources placed around the eye that are activated sequentially (col. 5: 44-57), illuminating the eye. Light reflected from the eye is received by a CCD detector (col. 5: 40-43) and a computing means takes advantage of the contrast between the cornea and the sclera to determine the limbus boundary (col. 10: 4-23) using known techniques.

Oltean et al. lacks or does not expressly disclose determining the diameter of the limbus. However, *Oltean et al.* has provided a device that detects the limbus boundary in a patentably indistinct manner to Applicant's invention. Determining a diameter of an object within an image is known in the art and easily accomplished when given the distance of the image recorder from the object. It would have been obvious to one of ordinary skill in the art to calculate the dimension of the limbus from an image of an annular limbus reflection.

Regarding claims 2 and 18, *Oltean et al.* does not expressly disclose an output device. However, the Examiner takes Official Notice that devices that display images and related information are common in the art and would have been obvious to one of ordinary skill in the art to include at the time the invention was made.

Regarding claims 3 and 19, *Oltean et al.* discloses a fixation system (596), which is common in the art.

Regarding claims 5 and 17, *Oltean et al.* does not expressly disclose combining multiple images or a computing device with a frame grabber. However, *Oltean et al.* discloses illuminating light sources sequentially and measuring the annular light pattern as a whole (col. 5: 50-53). This inherently includes combining data from images recorded with the individual light sources.

Regarding claims 6-9, *Oltean et al.* discloses a laser source, an infrared source, and a red laser source (col. 10: 57 to col. 11: 12) but does not expressly disclose a slit source laser. However, the Examiner takes Official Notice that slit source lasers are

common in the art. It would have been obvious to one of ordinary skill in the art to use a slit source laser at the time the invention was made.

Regarding claims 10 and 11, *Oltean et al.* does not expressly disclose determining the iris-angle diameter or the appropriate size of an intra-corneal lens. However, these measurements are inherently based on the limbus diameter and are recognized by ones of ordinary skill in the art as reasons why an accurate limbus diameter calculation is desired. It would have been obvious to one of ordinary skill in the art to determine these measurements once the limbus diameter was calculated.

Regarding claims 12 and 20, *Oltean et al.* does not expressly disclose a fixed focus system. However, the Examiner takes Official Notice that fixed focus systems are common in the art. It would have been obvious to one of ordinary skill in the art to have a limbus diameter calculation apparatus be a fixed focus system in order to simplify the operation of the focusing of the apparatus to one lateral movement.

Regarding claims 13 and 21, *Oltean et al.* discloses a light detector in the center of the annular light source array (FIG. 10, ref. 249). The detector would inherently be located along the optical axis of the eye for the light source array to illuminate the limbus.

Regarding claims 14 and 22, *Oltean et al.* discloses a filter (col. 10: 47-56).

Regarding claims 15 and 23, *Oltean et al.* does not expressly disclose using triangulation to determine the diameter of the limbus. However, the Examiner takes Official Notice that triangulation as a method of determining the 3D position of components of the eye is well known in the art. It would have been obvious to one of

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ordinary skill in the art to use triangulation in order to have an accurate 3D frame of reference from which to make the limbus diameter calculation.

6. Claims 16 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Oltean et al.* in view of U.S. Patent No. 5,865,832 to *Knopp et al.* *Oltean et al.* does not expressly disclose the illumination sources places between 25° and 90° from the image recorder. *Knopp et al.* teaches a lateral movement tracker with multiple illumination sources (FIG. 2, ref. 8) at roughly 45° from the eye's optical axis. The tracking system includes means for sensing contrast at the limbus and is therefore relevant. Setting the angle of the incident light at between 25° and 90° in a limbus diameter calculation device would have been obvious to one of ordinary skill in the art in order to obtain the best contrast profile in the recorded images.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,193,371 to *Snook* discloses a keratometer/pachymeter with triangulation. U.S. Patent No. 4,761,071 to *Baron* discloses an apparatus for determining corneal and scleral topography. U.S. Patent No. 5,094,521 to *Jolson et al.* discloses an eye alignment evaluator, which allows for corneal diameter measurement.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John R. Sanders whose telephone number is (703) 305-4974. The examiner can normally be reached on M-F 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin M. Lateef can be reached on (703) 308-3256. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3590 for regular communications and (703) 308-0758 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0858.



March 7, 2003



Marvin M. Lateef
Supervisory Patent Examiner
Group 3700